

Ruminant Nutrition: Feedstuff Modification and Growing/Finishing Nutrition

149 Effects of chemical treatment of canola meal on nutrients ruminal degradation in Zel sheep using in situ methods. A Teimouri Yansari*¹ and H. MohammadZadeh¹, ¹University of Agriculture and Bioresource, Sari, Mazandaran, Iran, ²University of Agriculture and Bioresource, Sari, Mazandaran, Iran.

The experiment was conducted to determine the effect of chemical treatment on in situ degradation of dry matter, crude protein and neutral detergent fiber (NDF) of canola meal (CM). Canola meal was treated by spraying with acetic acid, formic acid, hydrochloric acid, sulfuric acid and formaldehyde at 0.0, 1.0, 2.5 and 5.0% (vol/wt). Ruminal degradability of CM was measured by the nylon bag technique using two fistulated Zel ewes (approximately 1 yr old, BW= 30±2 kg) fed alfalfa hay and barely grain in a ratio of about 75:25 (DM basis). Incubation time consisted of 1, 3, 6, 12, 24, 36 and 48 h. This experiment was a completely randomized design with 5×3 factorial arrangement of treatment. Ruminal degradability of DM, CP and NDF were significantly influenced by chemical treatment, level, and the interaction of chemical treatment and level. The acids and formaldehyde significantly reduced the soluble, potential degradable fraction, and rate of degradation of DM and protein. Only acids significantly increased the soluble, potential degradable fraction, and rate of degradation of NDF. However, formaldehyde was not influenced by rumen degradability of NDF. In addition, as the concentration of acids increased, their influences were similarly increased. The results of this experiment showed that chemical treatment can improve the utilization of CM in ruminants by reducing and increasing of ruminal degradation of protein and NDF, respectively.

Key Words: Canola Meal, Ruminal Degradability, Nylon bag Technique

150 Effects of chemical treatments of rice straw on rumen fermentation, fibrolytic enzyme activities and populations of liquid- and solid-associated ruminal microbes in vitro. X. L. Chen, J. K. Wang, Y. M. Wu, and J. X. Liu*, *College of Animal Sciences, Ministry of Education Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China.*

The study was to investigate the effects of treatment of rice straw (RS) with NaOH (SH) and NH₄HCO₃ (AB) on fermentation, fibrolytic enzyme activities and populations of liquid- and solid-associated ruminal microbes in vitro. Fibrolytic specific activities were estimated by the amount of reducing sugars released from the solid-bound microbes. Total DNA was extracted from the liquid- and solid-associated ruminal microbes, respectively, and populations of rumen fungi, *Ruminococcus flavefaciens* (Rf) and *Fibrobacter succinogenes* (Fs) were determined by real-time quantitative PCR. Microbial protein mass increased with incubation time, and was higher for the treated straws than for the untreated (P<0.05). Both treated and untreated straws maintained a typical roughage type of fermentation with a high proportion of acetate. The SH treatment increased carboxymethyl cellulase and avicelase activities at all incubation times. Both SH and AB treatments significantly increased xylanase activity. Rumen fungi were significantly increased with incubation time in both liquid and solid phases for SH-RS, but not affected by AB treatment. Both solid- and liquid-associated Rf were higher in treated straws than in the untreated, with higher solid-associated Rf in SH-RS than in AB-RS at

early incubation. Solid-associated Fs was lower and liquid-associated Fs was higher in SH-RS than in other two straws. Liquid-associated Fs was lower at early incubation in AB-RS. It is inferred that chemical treatments enhance the nutritive value of RS through improving rumen fermentation and fibrolytic enzyme activities, and has great influences on rumen microbial distribution and populations, but their fluctuating pattern with incubation time is slightly different between two treated straws.

Key Words: Rice Straw, Fermentation, Ruminal Microbes

151 Effects of feeding thermochemically-treated wheat straw and corn stover on lamb performance and digestibility. N. A. Pyatt¹, P. H. Doane¹, M. J. Cecava*¹, J. L. Dunn¹, J. R. Sewell², and L. L. Berger², ¹ADM Animal Nutrition Research, Decatur, IN, ²University of Illinois, Urbana.

Fifty-two individually-fed lambs (39.37 ± 0.62 kg) were utilized in a 28-day 2 × 3 (+1) factorial design study to assess if thermochemically-treated wheat straw and corn stover can replace corn in ruminant diets. Wheat straw or corn stover were treated with 5% CaO and water in a double-shaft enclosed mixer (Readco® Continuous Processor) and subsequently pelleted with DDGS (75% residue:25% DDGS; DM basis) to form corn replacement pellets (CRP). The Control diet consisted of 45% cracked corn, 24% DDGS, 12% soyhulls, 10% grass hay, 6% supplement, and 3% cane molasses. The CRP was fed at 0%, 20%, 40%, or 60% of diet DM and replaced corn and DDGS. Final weight tended greatest for lambs fed Control, 40% CRP-straw, or 20% CRP-stover diets, and least for animals fed either 60% CRP treatment. Final BW decreased linearly with CRP inclusion but more so for stover than straw. Feeding 20% CRP-stover and 40% CRP-straw lambs maintained gain at about 90% of Control. Intake increased with increasing amounts of CRP-straw, but decreased with CRP-stover. Cumulative feed efficiency of 20% CRP-stover and 40% CRP-straw lambs was maintained at 81.5% and 88.9% of Control lambs. Gain and efficiency decreased linearly with CRP inclusion, but at a greater rate for CRP-stover. Fecal DM output increased and DM digestibility decreased linearly with CRP treatment, but at a greater rate and extent for CRP-stover. In general, CRP lambs had 9.7% greater DMI, 52.3% greater manure output, and 26.4% lesser DM digestibility. However, lambs fed 20 or 40% CRP-straw or 20% CRP-stover had similar (P>0.31) DM and OM digestibility versus Control. Lambs fed CRP tended to have greater intakes of protein, NDF, and ADF but similar digestibility of these nutrients versus Control. Phosphorus digestibility tended lower for CRP diets. Feeding treated straw or stover at ≤ 30% of diet DM to replace corn may be feasible in ruminant diets.

Key Words: Ruminants, Corn Replacement, Treated Crop Residues

152 Effects of feeding thermochemically-treated crop residues on lamb intake and performance. N. A. Pyatt¹, P. H. Doane¹, M. J. Cecava*¹, J. L. Dunn¹, J. R. Sewell², and L. L. Berger², ¹ADM Animal Nutrition Research, Decatur, IN, ²University of Illinois, Urbana.

Two 30-day lamb growth experiments were conducted to assess thermochemically-treated crop residues in lamb diets. In both studies,

residues were mixed with 5% CaO and water in a double-shaft enclosed mixer (Readco® Continuous Processor) and subsequently pelleted with DDGS (75% residue:25% DDGS; DM basis) to form a corn replacement pellet (CRP). The Control diet contained (DM basis) 45% cracked corn, 24% DDGS, 12% soyhulls, 10% cottonseed hulls, 6% supplement, and 3% cane molasses. In Exp 1, 7 treatments were fed to lambs (n = 55; 25.6 ± 1.3 kg) in a 3 × 2 (+1) factorial. The CRP containing treated switchgrass, wheat straw or wheat chaff was fed 30% or 60% of diet DM and replaced corn and DDGS. In Exp 2, lambs (n = 56; 32.0 ± 1.4 kg) were fed Control diets in which CRP was fed at 30% of diet DM to replace corn and DDGS. Residues evaluated were wheat straw, wheat chaff, corn fiber, switchgrass, and 3:1 blends of corn fiber:wheat straw or corn fiber:wheat chaff. In Exp 1, feeding CRP increased feed intake with 30% CRP causing greater final weight and cumulative ADG (quadratic; P<0.05). Cumulative feed efficiency was 8.5% better (quadratic; P<0.05) for 30% CRP but 21.9% worse for 60% CRP versus Control. Relative efficacy of treated residues as potential corn replacements were wheat chaff > wheat straw > switchgrass. In Exp 2, interim and final weights were not different, but tended less for lambs fed CRP. Cumulative ADG for CRP diets was 15.9% less than Control but feeding CRP containing corn fiber and corn fiber:wheat chaff maintained growth at 90% of Control. Cumulative DMI was not different but cumulative feed efficiency was 20.3% worse for lambs fed CRP diets. Feed efficiency was similar for Control and CRP containing corn fiber:chaff or corn fiber. Thermochemically-treated corn fiber and crop residues fed at ≤ 30% of diet DM may be feasible alternatives to corn in ruminant diets.

Key Words: Ruminants, Corn Replacement, Treated Crop Residues

153 Digestibility of corn replacement pellets in growing lamb diets. J. R. Sewell¹, L. L. Berger¹, M. J. Cecava², P. H. Doane², J. L. Dunn², and N. A. Pyatt², ¹University of Illinois, Urbana, ²ADM Animal Nutrition Research, Decatur, IN.

The objective of this study was to evaluate nutrient digestibility of native (NAT) and thermochemically-treated crop residues (wheat straw, WS; corn stover, CS) relative to corn in ruminant diets. Treated residues were processed with 5% CaO and water in a double-shaft enclosed mixer (Readco® Continuous Processor) and subsequently pelleted with DDGS (75% residue: 25% DDGS; DM basis) to form corn replacement pellets (CRP). The Control diet consisted of 54% cracked corn, 22% DDGS, 22% corn silage, 2% CaCO₃, and 0.04% urea on a DMB. Native and treated residues and DDGS were fed at 0, 30, or 60% of diet DM with the amount of DDGS in the diet equalized within feeding level for treated or NAT residue. All diets contained 0.4% urea and non-CRP diets contained 2% CaCO₃ (DMB). Lambs (6 per treatment; 31.45 kg) housed in metabolism crates were fed diets at 1.8% of BW and used to determine total tract nutrient digestion. In Exp 1, diets were (DMB): 1) 54% corn, 2) 30% WS CRP, 3) 60% WS CRP, 4) 30% ground NAT WS: DDGS, and 5) 60% ground NAT WS. In Exp 2, CS replaced WS in CRP and NAT CS replaced NAT WS in diets. Data were analyzed using the MIXED procedure of SAS. In Exp 1, DM digestibility for diets 1-5 were: 87.7%, 81.3%, 69.6%, 74.1%, and 60.9%, respectively. Treating crop residue and feeding as part of a CRP increased digestion of DM, NDF, and ADF compared with feeding NAT residue (P<0.05). Feeding WS CRP versus a blend of NAT WS and DDGS at 30% and 60% of diet DM increased NDF digestibility by 48.3% and 103%, and ADF digestibility by 86.0% and 55.7%, respectively. In Exp 2, DM digestibility of diets 1-5 were: 92.2%, 83.3%, 70.7%, 76.4%, and 66.9%, respectively. Feeding treated

CS as part of a CRP increased DM, NDF, and ADF digestibility versus feeding NAT CS (P<0.05). Feeding CS CRP versus a blend of NAT CS and DDGS at 30% and 60% of diet DM increased NDF digestibility by 46.5% and 44.2%, and ADF digestibility by 92.2% and 35.2%. Thermochemically treating crop residues improved nutrient digestibility by growing lambs.

Key Words: Corn Replacement, Digestibility, Lambs

154 Effects of diet adaptation on performance and health of steers grown on a high-concentrate, program-fed diet. B. P. Holland*, C. R. Krehbiel, D. L. Step, L. O. Burciaga-Robles, and J. J. Cranston, Oklahoma State University, Stillwater.

Five hundred thirty-six steers (initial BW = 284 kg) originating from auction markets were used to evaluate four methods of adaptation to a high-concentrate diet for a 60 d growing period. Steers were blocked by arrival date and BW and allocated by adaptation treatment into 24 pens. Treatment 1 included three diets with an increasing percentage of concentrate from 65% to 80% fed ad libitum during the first 21 d prior to feeding an 88% concentrate diet (TRAD). Steers in Treatment 2 were fed ad libitum the same 65% concentrate diet as in TRAD for the first 28 d, followed by adaptation to and feeding of the 88% concentrate diet (REC). Steers in Treatment 3 were fed similarly to TRAD; however, maximum feed intake was limited to 2.1, 2.3, and 2.5 times the arrival maintenance energy requirement for wk 1, 2, and 3, respectively (LMI). Steers in Treatment 4 were initially fed a restricted level of the 88% concentrate diet with daily increases in intake of 0.23 kg/d (PF). Steers in all treatments were fed the final diet at a level that targeted ADG at 1.13 kg/d. Fecal samples were obtained on d 11, 22, 43, and 60 from 6 steers/pen for pH measurement. BW, ADG, and ratio of daily ME intake:ADG (MEG) did not differ among treatments for the first 22 d (P=0.58; 0.41; 0.57, respectively). However, on d 43, REC steers had greater (P<0.01) BW and ADG than TRAD, LMI, and PF steers. Day 60 BW tended (P=0.056) to be greater for REC (352 kg) and TRAD (350 kg) steers than LMI (347) and PF (345 kg) steers. REC steers had the greatest (P<0.01) daily ME intake and lowest (P=0.03) MEG over the growing period. Fecal pH was not affected by treatment, but decreased (P<0.01) from d 11 (6.73) and 22 (6.72) to d 43 (6.59) and 60 (6.61). Bovine respiratory disease morbidity was greater (P=0.02) for TRAD (45.9%) and PF (43.6%) than REC (34.0%) and LMI (29.6%). Feeding a 65% concentrate receiving diet for 28 d after arrival improved growth efficiency and decreased morbidity of high-risk steers.

Key Words: Adaptation, Limited Maximum Intake, Program Feeding

155 Effects of roughage level and Fibrozyme™ supplementation on site and extent of digestion by finishing beef steers. J. J. Cranston and C. R. Krehbiel*, Oklahoma State University, Stillwater.

Eight ruminally and duodenally cannulated crossbred beef steers (initial BW = 620.4 ± 57.2 kg) were randomly allotted to 1 of 4 treatments in a replicated 4 × 4 Latin square design with a 2 × 2 factorial arrangement of treatments. Dietary treatments were dry-rolled corn-based, and included (DM basis): 1) no enzyme and 9% alfalfa hay; 2) no enzyme and 4.5% alfalfa hay; 3) Fibrozyme (10 g•steer⁻¹•d⁻¹; Alltech Inc., Nicholasville, KY) and 9% alfalfa hay; or 4) Fibrozyme (10 g•steer⁻¹•d⁻¹) and 4.5% alfalfa hay. Roughage level had an effect (P = 0.04)

on DMI. Averaged across enzyme supplementation levels, steers fed diets containing 9.0% alfalfa hay consumed more DM than steers fed diets containing 4.5% alfalfa hay. With the effect on DMI, roughage level also influenced intake of OM, ADF, NDF, starch, and nitrogen ($P \leq 0.10$). Duodenal flow of any measured nutrients was not affected ($P \geq 0.12$) by treatment. With the increased intake, roughage level also affected ($P \leq 0.06$) fecal excretion of OM, ADF, and NDF. However, fecal excretion of starch and nitrogen were not affected ($P \geq 0.15$) by roughage level. Ruminant digestibility, post-ruminant digestibility, and total tract digestibility of OM, N, ADF, NDF, and starch were not affected ($P \geq 0.11$) by treatment. Similarly, ruminant microbial efficiency was not affected ($P \geq 0.44$) by treatment. Increasing roughage level decreased ($P = 0.01$) particulate passage rate and increased ($P = 0.02$) the outflow of ruminal liquid. Increasing roughage level in the diet also increased ($P = 0.04$) the amount of time steers spent ruminating. The greater dietary roughage level decreased ($P = 0.02$) ruminal ammonia concentrations. An enzyme supplementation \times roughage level interaction was detected ($P = 0.02$) for ruminal pH. Neither total ruminal VFA concentrations, nor molar proportions of acetate and propionate were affected by treatment ($P \geq 0.12$). While small changes in roughage level may influence intake and passage kinetics, it appears that nutrient digestibility remains fairly constant in dry-rolled corn-based finishing diets.

Key Words: Beef Cattle, Roughage Level, Fibrolytic Enzyme

156 The effect of delaying initial implant on finishing performance and carcass characteristics. W. A. Griffin*, D. C. Adams, and R. N. Funston, *University of Nebraska West Central Research and Extension Center, North Platte.*

Two separate two yr experiments were conducted to determine the effect of delaying initial feedlot implant on performance and carcass characteristics. Steers were preconditioned prior to feedlot entry. At receiving, steers were assigned to one of two treatments: 1) implant at feedlot entry (Norm) or 2) implant 30 d after feedlot entry (Delay). In exp. 1, steers ($n = 200$) were not implanted until feedlot entry; however, in exp. 2 steers ($n = 209$) were implanted at branding with Synovex C (Fort Dodge Animal Health, Overland Park, KS). Initial feedlot implant was Synovex S (Fort Dodge Animal Health, Overland Park, KS). At reimplant steers were given Synovex-Choice (Fort Dodge Animal Health, Overland Park, KS). Steers were reimplanted an average of 83 and 115 d after initial implant for Delay and Norm, respectively in exp. 1, and an average of 89 and 119 d after initial implant for Delay and Norm, respectively in exp. 2. In exp.1, initial BW, reimplant BW, and final live BW were not different ($P = 0.16$); however, BW at initial implant for Delay was 10 kg heavier for Norm ($P < 0.01$). In exp. 1 overall ADG was not different ($P = 0.68$); however, Norm had higher ADG for the first 30 d of the finishing period ($P = 0.02$). In exp. 2, BW measures were not different for Norm and Delay ($P = 0.89$). In both experiments, HCW, 12th rib fat thickness, LM area, and yield grade were not different ($P = 0.28$). In exp. 1, there was a significant yr \times treatment effect for marbling score ($P = 0.05$) and percent of steers grading choice or higher ($P = 0.05$) with Delay grading 22.0% units more choice than Norm in yr 1 and Norm grading 14.5% units more choice than Delay in yr 2; however, in exp. 2, marbling score and percent choice were not different ($P = 0.28$). In these studies, delaying initial feedlot implant had no affect on animal performance. However, because of the yr \times treatment interaction in exp. 1, delaying implant may affect quality grade.

Key Words: Feedlot, Implant, Performance

157 Effect of Dakota Bran inclusion on DMI, gain, efficiency, and carcass characteristics of finishing steers. D. M. Larson*¹, M. L. Bauer¹, G. P. Lardy¹, K. K. Karges², and M. L. Gibson², ¹*North Dakota State University, Fargo,* ²*Dakota Gold Research Association, Sioux Falls, SD.*

A study was conducted to evaluate the effect of Dakota Bran (DB) inclusion on DMI, ADG, G:F, and carcass characteristics of finishing steers. Fifty-eight beef steers (454 ± 10 kg initial BW) were assigned randomly within weight strata to one of five dietary treatments. The diet DM consisted of 84% dry-rolled corn, 8% mixed hay, 5% liquid supplement, and 3% dry supplement providing 27.5 mg/kg monensin. Treatments consisted of DB replacing 0 ($n = 8$), 40 ($n = 10$), 50 ($n = 8$), 60 ($n = 9$), or 70% ($n = 9$) of dry-rolled corn DM. Steers were fed individually once daily using a Calan Broadbent feeding system. Body weight was measured every 28 d, individual feed offered recorded daily, and individual feed refusal recorded weekly. Steers were implanted with Synovex Choice on d 0 and were fed for 57, 77, or 105 d. Data were analyzed with the MIXED model of SAS with 0 vs. 40% DB, and linear and quadratic within DB level contrasts ($P \leq 0.05$). There were no differences ($P \geq 0.17$) between 0 and 40% DB treatments. Final BW (600 ± 7 kg; $P = 0.34$) and ADG (1.81 kg/d; $P = 0.40$) were not affected by DB level. The DMI increased ($P = 0.05$; quadratic) to 60% DB (11.25 ± 0.40 kg) and decreased at 70% (10.07 ± 0.40 kg) while G:F decreased ($P = 0.02$) linearly with increasing DB (192 to 170 ± 8 g/kg). Calculated apparent NEm decreased ($P = 0.02$) linearly with increasing dietary DB. Level of DB did not affect ($P \geq 0.18$) 12th rib fat (1.03 ± 0.17 cm), LM area (87.3 ± 2.9 cm²), KPH ($2.11 \pm 0.14\%$), or yield grade (2.71 ± 0.23) but marbling responded quadratically ($P = 0.05$) and was lowest at 50% and greatest at 70% (420 vs. 493 ± 25 ; $400 = \text{small}^0$). It appears that replacing more than 60% of corn with DB negatively influences DMI while G:F is negatively impacted by increasing DB inclusion above 40%. However, further study with an increased number of observations is needed to fully quantify the effect of high levels of DB inclusion on finishing steer performance.

Key Words: Steers, Dakota Bran, Finishing

158 Effect of corn endosperm type and processing method on site and extent of nutrient digestion and ruminal metabolism in Holstein steers fed a high-grain diet. C. A. McPeake* and S. R. Rust, *Michigan State University, East Lansing.*

This experiment was conducted to evaluate the interaction between corn grain endosperm type and processing method on site of nutrient digestion and ruminal metabolism in steers consuming a high-grain diet. Ten ruminally, duodenally, and ileally cannulated Holstein steers (initial BW = 200 ± 21 kg) were used in a replicated 4×4 Latin square design experiment with a 2×2 factorial arrangement of treatments. Treatments were grain endosperm type (floury and flinty) and processing method (high moisture and dry-rolled). Interaction of treatments had no effect on any measure of digestibility or ruminal metabolism. Starch intake tended to be greater for diets containing dry-rolled corn, resulting in lower apparent ruminal degradability ($P = 0.02$) and greater starch passage ($P = 0.01$) to the duodenum. When expressed as a percentage of duodenal flow, 21% less starch was digested in the small intestine of steers consuming diets containing dry-rolled corn. Likewise, an 8% decline in apparent total-tract starch digestibility was witnessed when feeding dry-rolled corn. Ruminal passage rate of liquid was significantly higher ($P = 0.03$) for floury

endosperm treatments, while diets containing dry-rolled corn tended to have higher ruminal passage rates of starch. Total molar proportion of volatile fatty acid tended to be greater for diets including grain comprised of flourey endosperm. While ruminal pH was unaffected by treatments, diets consisting of flinty endosperm resulted in greater ruminal ammonia levels ($P < 0.05$). Dry-rolled corn treatments tended to result in higher molar concentrations of lactate. Relative to nitrogen digestibility, diets containing high moisture corn resulted in greater amounts of microbial nitrogen flow to the duodenum, greater apparent post-ruminal nitrogen digestibility, and greater microbial efficiency ($P < 0.05$). Preservation method of corn grain appears to have a more profound impact on site and extent of nutrient digestibility than corn grain endosperm type.

Key Words: Corn Hybrid, Digestibility, Processing

159 The effects of feeding ground flaxseed on morbidity, mortality, and performance in receiving heifers and subsequent feedlot performance. M. J. Quinn*, E. S. Moore, B. E. Depenbusch, M. L. May, J. J. Higgins, and J. S. Drouillard, *Kansas State University, Manhattan.*

Two trials were conducted at the Kansas State University Beef Cattle Research Center to determine the effects of feeding ground flaxseed during the receiving period on growth, health, and subsequent feedlot performance of finishing heifers. Crossbred heifers (trial 1 $n=363$, initial BW 214 ± 1 kg; trial 2 $n=377$, initial BW 222 ± 1 kg) were purchased from salebarns in Edmonton, KY during January and March of 2006. Heifers were fed receiving rations based on steam-flaked corn with 0 (Control), 2, 4, or 6% ground flaxseed (DM basis) for 56 d. Following the receiving period, cattle were fed steam-flaked corn based diets until slaughter for 150 d and 147 d, respectively. Heifers were implanted 91 and 109 d prior to slaughter, respectively. In trial 1, DMI during the receiving period tended to increase linearly with increasing flaxseed in the diet ($P < 0.10$). ADG was 1.46, 1.56, 1.58, and 1.61 kg/d for heifers fed 0, 2, 4, and 6% flax, respectively (linear, $P < 0.03$). Final BW after the finishing period was significantly increased with increasing inclusion of flax in the receiving diets (linear $P < 0.05$). In trial 2, growth performance, morbidity, or mortality during the receiving period were not different between treatments ($P > 0.05$). During the finishing period DMI were 8.4, 8.4, 8.0, and 8.1 kg/d for 0, 2, 4, and 6% flax, respectively (linear, $P < 0.05$). In trial 2, LM areas were greatest for cattle fed 2% flax at receiving (quadratic, $P < 0.05$). In general, feeding flaxseed during the receiving period may improve growth performance and carcass weights through finishing. However, there is some variation that exists, and cattle fed flax may not always respond similarly.

Key Words: Flax, Receiving, Heifers

160 Effect of feeding das-59122-7 corn grain and non-transgenic corn grain to finishing feedlot steers. T. J. Huls*¹, G. E. Erickson¹, T. J. Klopfenstein¹, M. K. Luebke¹, K. J. Vander Pol¹, D. W. Rice², B. L. Smith², M. A. Hinds², F. N. Owens², and M. K. Liebergesell², ¹*University of Nebraska, Lincoln*, ²*Pioneer Hi-Bred International, Inc., Johnston, IA.*

An experiment was designed to evaluate the performance of steers fed grain produced from a non-segregating transgenic maize line containing event DAS-59122-7 (59122). 59122 expresses the Cry34Ab1 and Cry35Ab1 proteins from *Bacillus thuringiensis* strain PS149B1. These proteins control corn rootworms. 59122 also contains the phosphinothricin acetyltransferase (*pat*) gene from *Streptomyces viridochromogenes* for herbicide tolerance. Sixty steers (initial BW = 396 ± 15 kg), individually fed using Calan gates, consumed finishing diets containing either transgenic corn (59122), or a non-transgenic, near isoline hybrid (Control), or a conventional non-transgenic corn hybrid (Pioneer hybrid 35P12) for 109 d to determine nutritional equivalency. Dry rolled corn comprised 82% of diet DM along with 8.5% alfalfa hay, 5% molasses, and 4.5% supplement containing monensin and tylosin. Steer performance and carcass traits were statistically compared between steers consuming diets produced with 59122 corn and steers consuming diets produced with Control corns. False discovery rate was used to control for multiplicity. Steers fed diets produced with the conventional corn were used as an additional comparator creating tolerance intervals to evaluate the biological significance of any statistical differences. Dry matter intake, ADG, and G:F for steers fed diets containing the 59122 corn were not significantly different from steers fed Control corn, and fell within the tolerance intervals. Similarly, carcass characteristics were not different between Control and 59122. Feeding 59122 did not impact steer performance or carcass quality.

Table 1. Performance and carcass characteristics of steers fed different corn hybrids.

Item	CONTROL	59122	SEM	P-value
Final BW, kg ¹	553	562	7	0.357
DMI, kg/d	9.51	10.11	0.25	0.083
ADG, kg	1.45	1.53	0.06	0.377
G:F	0.153	0.151	0.006	0.799
Marbling score ²	463	475	19	0.651
Fat depth, cm	1.04	0.95	0.06	0.294

¹ Final BW calculated from HCW/0.63. ² 400 = Slight^o, 450 = Slight⁵⁰, 500 = Small^o

Key Words: Beef Cattle, Transgenic, Maize

Ruminant Nutrition: Ruminal Fermentation - Dairy

161 Effects of *Saccharomyces cerevisiae* on ruminal pH and microbial fermentation in lactating dairy cows. M. Thrune¹, A. Bach², M. Ruiz-Moreno¹, M. D. Stern*¹, and J. G. Linn¹, ¹*University of Minnesota, St. Paul*, ²*IRTA-Unitat de Remugants, Spain.*

An experiment was conducted with eight ruminal fistulated cows using a cross over design with 2 periods to determine the effects of yeast supplementation on rumen fermentation. Holstein dairy cows

in late lactation were either supplemented with 0.5g/head/day of *Saccharomyces cerevisiae*, an active dry yeast (CNCM-1077, Levucell SC20 (r)SC, Lallemand Animal Nutrition) or not supplemented (control). A basal diet consisting of 60% forage and 40% concentrate (DM basis), was fed once daily to both groups of cows throughout the entire experiment. Ruminal pH was measured continuously every 22 min using a pH probe that was placed in the ventral rumen sac for 6 d. Volatile fatty acid and ammonia N concentrations in the rumen were